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NEWS

High-Performance Plastics

Electronic applications drive growth in demand Page 21

CHEMICAL & ENGINEERING
NEWS
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SEPTEMBER 4, 1989

News of the Week

■ **West Germany's Hoechst discloses relatively weak first-half gains, but positive performances by other European giants allay analysts' fears of an economic downswing for European chemical industry.** Page 4

■ **Privately owned rocket makes landmark flight to launch payload into orbit, heralding emergence of U.S. commercial launch industry.** Page 4

■ **Voyager 2 last week completed what mission scientists are calling a nearly flawless encounter with the planet Neptune.** Page 5

■ **EPA orders 90% cut of industrial benzene emissions over the next several years, but cost to chemical producers will likely be negligible.** Page 5

■ **Washington-headquartered environmentalist group "Renew America" releases report calling for action on the environmental problems of the rural U.S.** Page 6

Cover: General Electric worker prepares electronic components with process that uses chemical bond for adhesion between metal and plastic substrates

Letters 2

Concentrates
Business 9
Government 13
Science/Technology 17

The Departments
Meetings 61
Newscripts 84

Business

Chemical industry productivity declined in the second quarter, after slowing in growth for some months, and unit labor costs continued to increase. **Page 11**

Government

Pentagon won't get any new funds for producing chemical weapons this coming fiscal year if House actions prevail in conference committee with Senate; industry support for National Science Foundation programs is growing, is now a significant factor in their funding. **Page 14**

Science Policy

Planning an R&D strategy for Europe 1992 will be challenging, complex for the 12 EC nations, according to recently released report. **Page 16**

Science/Technology

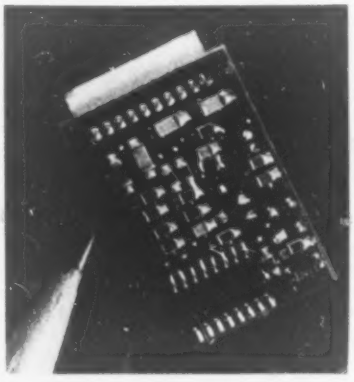
IUPAC ponders restructuring, efforts to publicize role of chemistry and increase visibility within the chemical community during its recent 35th general assembly. **Page 18**

Books

Arthur Kornberg's autobiography, "For the Love of Enzymes," presents personal development and scientific discoveries, expresses convictions on society and education. **Page 54**

ACS News

R&D executives rate ACS rather highly, a survey by the society's Corporation Associates shows; drug testing in the workplace, pollution prevention are topics of two recent ACS policy statements. **Page 60**



Product Report

Electronic, auto under-the-hood uses spur growth of high-performance plastics in markets that have been dominated by ceramics and specialty metals. **Page 21**

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LETTERS

Methyl chloroform concern

SIR: In an article about stratospheric ozone (C&EN, June 26, page 33), you devoted a significant amount of space to describing the Environmental Protection Agency's presentation at an international conference last May. You accurately point out that some EPA staff members are concerned about their estimate of the impact of methyl chloroform on stratospheric ozone by the middle of the next century. What was not included in your description were the erroneous assumptions underlying this estimate.

The current concern about methyl chloroform is predicated on the belief that, left unchecked, production of the chemical will increase fourfold by the year 2050. Such growth of a specialty chemical that is already reaching the peak of its growth curve is unprecedented and extremely unlikely.

Methyl chloroform is not a substitute for most of the uses of the chlorofluorocarbons subject to the Montreal protocol, so such substitution will not be the cause of any significant growth. The EPA estimate of growth is based simply on that agency's prediction of a rise in gross national product. This simplistic approach ignores the following four factors that will work together to limit (or eliminate) growth in methyl chloroform: In addition to methyl chloroform there are other substitutes for CFC-113 (the only fully halogenated CFC for which methyl chloroform has any substitution potential); there is a distinct rise in the recycling and incineration of methyl chloroform; conservation and environmental stewardship programs initiated by the methyl chloroform producers will curtail emissions of the chemical by the many industries that depend on it; and EPA announcement of concern and efforts to discourage use of methyl chloroform in place of CFC-113 will have a chilling effect on the market.

Even with the erroneous assumptions, EPA's charts clearly indicate that little benefit would be gained from either a reduction in or phase-out of the chemical, compared with continued use at today's levels. The most striking aspect of EPA's charts is that the most important factor in reducing depletion is eliminating use of CFCs. This can only be done, with current technology, by using methyl chloroform and other replacements that, although they may have an ozone-depleting potential, will reduce depletion eight- to 12-fold compared with the CFCs they replace. In addition, EPA's charts recognize the urgent need to get all the nations of the world to sign the Montreal protocol. There is little doubt that reopening the protocol for the addition of chemicals would decrease our chances of obtaining more complete worldwide compliance. Such an action might be counterproductive, in light of the likelihood that methyl chloroform will not grow significantly during the coming years.

Paul A. Cammer
President, Halogenated Solvents Industry Alliance
Washington, D.C.

Creating dearth of chemists

SIR: Industry has been crying wolf for a number of years about the impending dearth of chemists. ACS has tried to respond to the need by the use of creative programs to induce precollege students to seek careers in chemistry. However, despite all of these efforts, the number of graduating chemists has remained essentially static over the past decade in the face of an expanding economy and increasing college enrollments.

The article "Chemical Firms Growing Wary of Lawsuits in Terminating Employees" (C&EN, May 22, page 23) has indicated one of the problems associated with efforts to increase the number of would-be chemists. This article shows clearly that many chemical companies have been terminating their older chemists with little regard for the past and present achievements of these same chemists and at the same time desperately recruiting younger chemists. I testified about this problem before the Senate Subcommittee on Labor in May 1988 at a hearing devoted to the issue of waivers. The stories about the arbitrary use of waivers to force older individuals out of not only retrenching but also expanding companies were nightmarish.

What sort of example has been set for potential young chemists by this arbitrary behavior of some of the members of the chemical industry? Older terminated chemists certainly would not recommend chemistry as a profession to any precollege or college students making a choice as to their future career. Young industrial chemists are not blind to what is occurring to their older colleagues and are questioning their career choice. Any dearth of chemists in the future can rightly be partially attributed to the callous treatment of older chemists by too large a number of chemical companies. I suggest that chemical com-

Chemical Industry Productivity Falls in Second Quarter

Decline, a sign of a slowing chemical economy, is result of flat output and increased workhours, is coupled with rise in unit labor costs

Productivity growth in the chemical industry has been slowing for some months and in the second quarter it stopped growing at all and actually dropped, based on calculations using recently released government figures. This is the first time in two and a half years that a quarter-to-quarter change in productivity has been lower than zero.

The pattern of productivity increases shows the signs characteristic of the latter stages of a business expansion—year-to-year growth slowing for each quarter and quarter-to-quarter changes fluctuating between growth and shrinkage. This is brought about essentially by production growth not keeping pace with employment. Productivity is figured by dividing indexes for production by indexes for aggregate weekly hours of production, which are a function of total production employment and the number of hours worked. This gives an index for unit output per hour of labor.

For the second quarter of 1989, production of chemicals and allied products showed no change from the first quarter and the index of hours increased 1.0% to 101.1 (all indexes are on a 1977 = 100 basis). The result was that productivity for the quarter declined 0.9% from the first quarter to 157.2. For the first quarter, productivity was up a scant 0.1% from fourth-quarter 1988.

On an annual basis, second-quarter productivity improved 2.6% from the same period in 1988 as output rose 8.2% and workhours climbed 3.6%. Productivity in the first quarter was up 5.4% on a year-to-year comparison. Thus second-quarter annual growth has slowed considerably from that in the first quarter.

Chemicals in quarterly comparisons did not do so well as all manufacturing. Productivity in this sector of the economy is still growing, rising 0.8% in the second quarter from the first to an index of 153.2. First-quarter productivity for all manufacturing was up 0.4% from the fourth quarter. On an annual basis, second-quarter productivity for all manufacturing was up 3.4% from a year earlier. First-quarter productivity was up 3.8% from the first quarter of 1988.

While productivity for the chemical industry was falling in the second quarter, the other important measure—unit labor costs—was rising, also a sign of a slowing chemical economy and one that translates to a negative impact on companies' financial results. Unit labor costs are labor costs per unit of output, calculated by dividing indexes for wages by the indexes for output per workhour or productivity.

In the second quarter, unit labor costs for chemicals climbed 1.7% from the first quarter to an index of 128.5 as productivity fell 0.9% and wages increased 0.8%. This is the third straight rise for unit labor costs on a quarterly basis, although in both the first quarter of this year and in fourth-quarter 1988, this index rose a much more moderate 0.2%.

On an annual basis, unit labor costs for chemicals rose 0.6% in the second quarter from second-quarter 1988. This is the first annual increase since the third quarter of 1987. In the first quarter, unit labor costs declined 2.5% from the first quarter of 1988.

Again, all manufacturing is performing somewhat better than chemicals. Unit labor costs in this sector in the second quarter fell 0.4% from the first quarter, and were down 0.7% from the second quarter in 1988. However, in the first quarter,

Productivity for all manufacturing is still growing

Indexes, 1977 = 100	Quarters, 1989		Quarters, 1988				Quarters, 1987			
	2nd	1st	4th	3rd	2nd	1st	4th	3rd	2nd	1st
CHEMICALS & ALLIED PRODUCTS										
Production	158.9	158.9	157.4	154.5	149.5	146.7	144.2	141.8	138.2	135.8
Workhours	101.1	100.1	99.3	98.5	97.6	97.5	96.8	95.4	93.6	93.3
Productivity	157.2	158.7	158.5	156.9	153.2	150.5	149.0	148.6	147.6	145.6
Hourly production wages	202.0	200.4	199.9	197.4	195.6	195.1	195.2	193.2	191.3	189.8
Unit labor costs	128.5	126.3	126.1	125.8	127.7	129.6	131.0	130.0	129.6	130.4
ALL MANUFACTURING										
Production	148.0	147.0	145.8	144.0	141.6	139.5	137.9	135.7	133.2	131.6
Workhours	96.6	96.7	96.3	95.7	95.6	95.2	95.0	93.5	92.6	92.5
Productivity	153.2	152.0	151.4	150.5	148.1	146.5	145.2	145.1	143.8	142.3
Hourly production wages	183.5	182.8	181.4	179.2	178.6	177.2	176.2	174.4	173.8	173.5
Unit labor costs	119.8	120.3	119.8	119.1	120.6	121.0	121.3	120.2	120.9	121.9

Sources: Federal Reserve Board, Department of Labor

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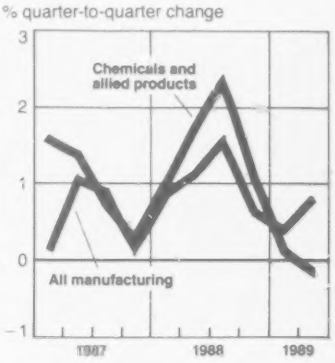
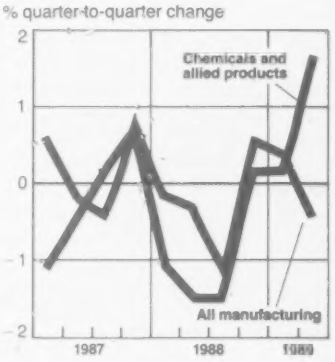
Chemical productivity declines...



...and unit labor costs continue to rise



Note: Productivity is output per workhour, calculated by dividing indexes for production by indexes for workhours of production employees. Unit labor costs are labor costs per unit of output, calculated by dividing indexes for wages by indexes for output per workhour.
Sources: Federal Reserve Board, Department of Labor

unit labor costs increased 0.4% from the previous quarter, although they were down 0.6% on an annual basis.

For the first six months of 1989, chemical productivity was up only 0.2% from the second half of 1988, but up 4.0% from the first six months last year. Productivity for all manufacturing increased 1.1% from the second half of 1988 and 3.2% from the first six months.

Unit labor costs for chemicals in the first half were up 1.1% from the second half of 1988, but down 1.0% from the first half. For all manufacturing, first-half 1989 unit labor costs rose 0.5% from the second six months of 1988, but declined 0.6% from first-half 1988.

William Storck